GUIDE TO THE IMPLEMENTATION OF ELECTRONIC TRANSCRIPTS AND STUDENT RECORDS

Pre-Kindergarten Through Postsecondary Edition

Part 1 of 9

Chapter 1: Introduction
Chapter 2: ASC X12 Nomenclature
Chapter 3: Acknowledgment Process

Authored by Members of the
American National Standards Institute
Accredited Standards Committee X12
Subcommittee A: Education Administration

Version 4
April 1998

Note to User:

The Electronic Transcripts and Student Records suite of formats is made up of five transaction sets:

TS130-Student Educational Record (Transcript)
TS131-Student Educational Record (Transcript) Acknowledgment
TS146-Request for Student Educational Record (Transcript)
TS147-Response to Request for Student Educational Record (Transcript)
TS997-Functional Acknowledgment

The "Guide to the Implementation of Electronic Transcripts and Student Records, Pre-Kindergarten through Postsecondary Edition" provides usage details for the elementary, secondary, and postsecondary education communities. Based on ANSI ASC X12 Version 4 Release 1, the Guide was made available in April 1998.

Part 1--Chapters 1-3: Additional critical information for proper use of the transaction sets as a whole
- Chapter 1: Introduction
- Chapter 2: ASC X12 Nomenclature
- Chapter 3: Acknowledgment Process

Part 2--TS130: Student Educational Record (Transcript)
Part 3--TS131: Student Educational Record (Transcript) Acknowledgment
Part 4--TS146: Request for Student Educational Record (Transcript)
Part 5--TS147: Response to Request for Student Educational Record (Transcript)
Part 6--TS997: Functional Acknowledgment
Part 7--Appendix A: Change Summary
Part 8--Appendix B: Data Element Dictionary
Part 9--Appendix C: Segment Summary

The above documentation is available electronically, free of charge, in Microsoft Word 97 format (.doc), Portable Document Format (.pdf), and Rich Text Format (.rtf) from http://nces.ed.gov/edi.html under the "Implementation Documents" link. Bound copies may be purchased from the AACRAO Distribution Center by calling (301) 490-7651 or by fax at (301) 206-9789. The publication order number is 6007.

Documentation for the five transaction sets was developed using SpecBuilder Version 3.2 from EDIfECS Corporation and is downloadable in native SpecBuilder format (.eds) from their web page-http://www.edifecs.com. This format provides a navigable version of the transaction sets and is intended to be used as a replacement for the hyper-linked capability provided in the previous version of the Guide. A copy of either SpecViewer (downloadable, free of charge, from the EDIfECS home page) or SpecBuilder (available from EDIfECS) is required to view the native SpecBuilder output. While it is possible to print from either SpecViewer or SpecBuilder, it is suggested that locally printed copies be generated from the .doc, .pdf, or .rtf files since they have been enhanced for that purpose.

A postsecondary edition has been published by the Postsecondary Electronic Standards Council and is available, free of charge, electronically at http://www.standardscouncil.org/transsets.htm. Bound copies may be purchased from the AACRAO Distribution Center by calling (301) 490-7651 or by fax at (301) 206-9789. The publication order number is 6006.

Table of Contents

1 Introduction

1.1 Document Purpose

For the educational community to achieve the timely, uniform, and comparable exchange of information about students, Electronic Data Interchange (EDI) standards have been developed and need to be implemented consistently by all organizations. To facilitate a smooth transition into the EDI environment, uniform implementation is critical. The purpose of this implementation guide is to explain the developers' intent when the Student Educational Record transaction sets were designed and give guidance on how they should be implemented.

Specifically, this guide defines where data are put and when it is included for the ANSI ASC X12.130, X12.131, X12.146, X12.147, and X12.997 transaction sets for the purpose of conveying student information. The 146 is used to request student information; the 130 conveys the student information; the 131 is used to acknowledge the receipt of a 130; the 147 is used to respond to a 146 if the data are unavailable, and the 997 is a generic turnaround transaction set also used to acknowledge receipt of a transaction set and report syntactical errors. Refer to Chapter 3 for a detailed discussion of the response and acknowledgment process.

The official names for these transactions are:

ANSI ASC X12.130 – Student Educational Record (Transcript)
ANSI ASC X12.131 – Student Educational Record (Transcript) Acknowledgment
ANSI ASC X12.146 – Request for Student Educational Record (Transcript)
ANSI ASC X12.147 – Response to Request for Student Educational Record (Transcript)
ANSI ASC X12.997 – Functional Acknowledgment

This implementation guide is intended to provide assistance in the development and use of the electronic transfer of student educational record information. It is hoped that the entities that exchange student information will work to develop and exchange standard formats within the educational community.

1.2 About the Authors

These transaction sets and implementation guide have been developed by members of Task Groups 1 and 2 of Sub-Committee A Education Administration, an Accredited Standards Committee (ASC) under ANSI (American National Standards Institute). X12 is responsible for writing transaction standards for EDI. These task groups are comprised of numerous representatives from the education community, including:

- elementary/secondary education student records experts
- postsecondary education student records experts
- state and federal education agencies
- information technology consultants
- student administrative system software vendors

This implementation guide represents the best efforts of these organizations to bring forward the information and business requirements associated with student records transfer. As new or refined business requirements are identified, changes to this implementation guide will be made through these Task Groups. Anyone wishing to make changes or additions to this implementation guide should contact the chair of either Task Group. Chairs are listed with DISA (Data Interchange Standards Association), which is the secretariat for X12 and can be viewed at http://www.disa.org.

Providers of educational services require information about a student for appropriate placement in educational programs. Many receive this information in a variety of methods, either on paper, via phone,

or electronically. The information requirements will vary depending upon institution or agency type needing student information or a specific informational need of a division within such entities. Examples of entity types desiring to participate in the electronic exchange of student information include:

- Postsecondary Education
  - Colleges
  - Universities
  - State Higher Education Agencies

- Elementary/Secondary Education
  - Elementary Schools
  - Middle/Junior High Schools
  - High Schools
  - State Education Agencies

The Student Educational Record (Transcript) transactions were designed so that students may be properly placed in courses and educational programs at the next institution they intend to attend. The data available through these transaction sets can also be used to verify an individual's eligibility to enroll at an institution of learning or to convey state reporting information to agencies responsible for providing educational accountability information.

1.3 Other References

A complete list of publications that may be helpful to understanding EDI X12 transactions is available from DISA.

1.4 Version and Release

This implementation guide is based on the October 1997 ASC X12 standards referred to as Version 4 Release 1 (00401) published by DISA in December 1997.

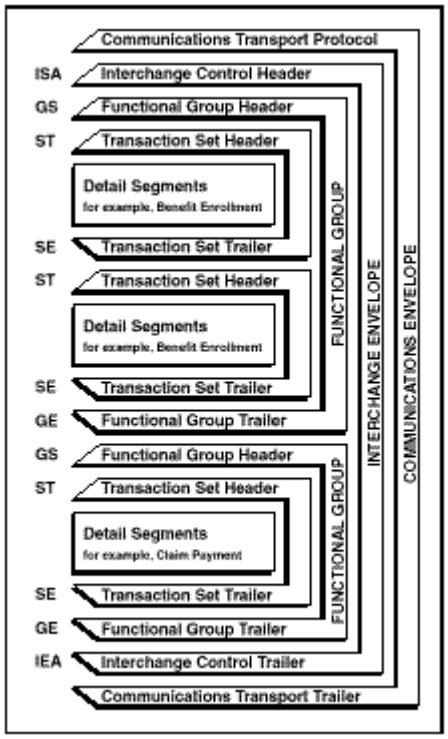
1.5 Standards Maintenance

The ANSI ASC X12 standards are under constant revision and refinement to meet the changing needs of the user community. This implementation guide will be updated annually, reflecting modifications approved with the yearly full release of the X12 standards. It is expected that the education community will upgrade local software to reflect these modifications within a year of the annual release of the Guide. For example, this guide was released in April 1998 so all local updates should be complete and in production by April 1999. In order to maintain continuity, however, it is important that users continue to support the previous release through the one year upgrade period.

2 ASC X12 Nomenclature

2.1 Transmission Overview

Figure 2.1 Transmission Control Schematic



The transmission of data proceeds according to very strict format rules to ensure the integrity and maintain the efficiency of the interchange. Each transaction set contains groups of logically related data in units called segments. For instance, the N4 segment conveys the city, state, ZIP Code, and other geographic information. A transaction set contains multiple segments, so the addresses of the different institutions, for example, can be conveyed from one computer to the other.

The sequence of the elements within one segment is specified by the ASC X12 Standard, as well as the sequence of segments in the transaction set. In a more conventional computing environment, the segments would be equivalent to records, and the elements equivalent to fields.

Similar transaction sets, called "functional groups," can be sent together within a transmission . Each functional group is prefaced by a group start segment (GS); and a functional group is terminated by a group end segment (GE). One or more functional groups are prefaced by an interchange header (ISA) and followed by an interchange trailer (IEA).

2.2 Building Blocks

2.2.1 Character Sets

This section is designed to have representation in the common character code schemes of EBCDIC, ASCII, and CCITT International Alphabet 5. The ASC X12 standards are graphic-character-oriented; therefore, common character encoding schemes other than those specified herein may be used as long as a common mapping is available. Because the graphic characters have an implied mapping across character code schemes, those bit patterns are not provided here.

The basic character set of this standard, shown in Figure 2.2, Basic Character Set, includes those selected from the uppercase letters, digits, space, and special characters as specified below.

Basic Character Set

A...Z	**0...9**	**!**	**“**	**&**	**’**	**(**	**)**	*****	**+**
’	**-**	**.**	**/**	**:**	**;**	**?**	**=**	**“ ” (space)**	

Figure 2.2 Basic Character Set

Extended Character Set

An extended character set may also be used by and includes the lowercase letters and other special characters as specified in Figure 2.3, Extended Character Set.

a..z	**%**	**`**	**@**	**[**	**]**	**-**	**{**
}	\	|	<	>	#	**$**	

Figure 2.3 Extended Character Set

Note that the extended characters include several character codes that have multiple graphical representations for a specific bit pattern. The complete list appears in other standards such as CITT S.5. Use of the USA graphics for these codes presents no problem unless data is exchanged with an international partner. Other problems arise, such as the translation of item descriptions from English to French, when exchanging data with an international partner, but minimizing the use of codes with multiple graphics eliminates one of the more obvious problems.

Control Characters

Two control character groups are specified; use of these should be limited to use as delimiters as described in Section 2.1.2.7. The common notation for these groups is provided, together with the character coding in three common alphabets. In Table A1, Base Control Set, the column IA5 represents CCITT V.3 International Alphabet 5.

Base Control Set

The base control set includes those characters that will not have a disruptive effect on most communication protocols. These are represented by:

Table 2.1 Base Control Set

Notation	Name	EBCDIC	ASCII	IA5
BEL	bell	2F	07	07
HT	horizontal tab	05	09	09
LF	line feed	25	0A	0A
VT	vertical tab	0B	0B	0B
FF	form feed	0C	0C	0C
CR	carriage return	0D	0D	0D
FS	file separator	1C	1C	1C
GS	group separator	1D	1D	1D
RS	record separator	1E	1E	1E
US	unit separator	1F	1F	1F
NL	new line	15		

The Group Separator (GS) may be an exception in this set because it is used in the 3780 communications protocol to indicate blank space compression.

Extended Control Set

The extended control set includes those that may have an effect on a transmission system. These are shown in Table 2.2, Extended Control Set.

Table 2.2 Extended Control Set

Notation	Name	EBCDIC	ASCII	IA5
SOH	start of header	01	01	01
STX	start of text	02	02	02
ETX	end of text	03	03	03
EOT	end of transmission	37	04	04
ENQ	enquiry	2D	05	05
ACK	acknowledge	2E	06	06
DC1	device control 1	11	11	11
DC2	device control 2	12	12	12
DC3	device control 3	13	13	13
DC4	device control 4	3C	14	14
NAK	negative acknowledge	3D	15	15
SYN	synchronous idle	32	16	16
ETB	end of block	26	17	17

Delimiters

A delimiter is a character used to separate two data elements (or subelements) or to terminate a segment. The delimiters are an integral part of the data. Delimiters are specified in the interchange header segment, ISA. The ISA segment is a 105 byte fixed length record. The data element separator is byte number 4; the component element separator is byte number 105; and the segment terminator is the byte that immediately follows the component element separator. Once specified in the interchange header, the delimiters are not to be used in a data element value elsewhere in the interchange.

Users of this implementation guide should be aware that an application system may use some valid delimiter characters within the application data. Occurrences of delimiter characters in transmitted data within a data element can result in errors in translation programs. The existence of asterisks (*) within transmitted application data is a known issue that can affect translation software.

2.2.2 Data Element

The data element is the smallest named unit of information in the ASC X12 standard. Data elements are identified as either simple or component. A data element that occurs as an ordinally positioned member of a composite data structure is identified as a component data element. A data element that occurs in a segment outside the defined boundaries of a composite data structure is identified as a simple data element. The distinction between simple and component data elements is strictly a matter of context because a data element can be used in either capacity.

Data elements are assigned a unique reference number. Each data element has a name, description, type, minimum length, and maximum length. For ID type data elements, this guide provides the applicable ASC X12 code values and their descriptions, code values and descriptions for externally maintained lists when possible, or references where the valid code list is too lengthy. The length of the data element value is the number of character positions used except as noted for numeric and decimal elements. The data element types shown in Table 2.3, Data Element Types, appear in this Implementation Guide.

Table 2.3 Data Element Types

Symbol	Type
Nn	Numeric
R	Decimal
ID	Identifier
AN	String
DT	Date
TM	Time

Numeric

A numeric data element is represented by one or more digits with an optional leading sign representing a value in the normal base of 10. The value of a numeric data element includes an implied decimal point. It is used when the position of the decimal point within the data is permanently fixed and is not to be transmitted with the data.

This set of guides denotes the number of implied decimal positions. The representation for this data element type is "Nn" where N indicates that it is numeric and n indicates the number of decimal positions to the right of the implied decimal point.

If n is 0, it need not appear in the specification; N is equivalent to N0. For negative values, the leading minus sign is used. Absence of a sign indicates a positive value. The plus sign (+) should not be transmitted. **The length of a numeric type data element does not include the optional sign.** Leading zeros should be suppressed unless necessary to satisfy a minimum length requirement. The use of triad separators (for example, the commas in 1,000,000) is expressly prohibited.

EXAMPLE

value is 123.4
min length is 5
type designation is N2
data stream value is –12340 (note padded zero)

Decimal

A decimal data element may contain an explicit decimal point and is used for numeric values that have a varying number of decimal positions. This data element type is represented as "R."

The decimal point always appears in the character stream if the decimal point is at any place other than the right end. If the value is an integer (decimal point at the right end) the decimal point should be omitted. For negative values, the leading minus sign (-) is used. Absence of a sign indicates a positive value. The plus sign (+) should not be transmitted. **The length of a decimal type data element does not include the optional sign or decimal point.**

Leading zeros should be suppressed unless necessary to satisfy a minimum length requirement. Trailing zeros following the decimal point should be suppressed unless necessary to indicate precision. The use of triad separators (for example, the commas in 1,000,000) is expressly prohibited.

EXAMPLE

value is 1234
min length is 5
type designation is R
data stream value is 01234 (note padded zero)

value is –123.45
min length is 5
type designation is R
data stream value is –123.45

value is –123.45
min length is 6
type designation is R
data stream value is –123.450 (note padded zero)

Identifier

An identifier data element always contains a value from a predefined list of codes that is maintained by the ASC X12 Committee or some other body recognized by the Committee. Trailing spaces should be suppressed unless they are necessary to satisfy a minimum length. An identifier is always uppercase and left justified. The representation for this data element type is "ID."

String

A string data element is a sequence of any characters from the basic or extended character sets. The significant characters shall be left justified. Leading spaces, when they occur, are presumed to be significant characters. Trailing spaces should be suppressed unless they are necessary to satisfy a minimum length. The representation for this data element type is "AN."

Date

A date data element is used to express the standard date in either YYMMDD or CCYYMMDD format in which CC is the first two digits of the calendar year; YY is the last two digits of the calendar year (00 to 99), MM is the month (01 to 12), and DD is the day in the month (01 to 31). The representation for this data element type is "DT." The six-digit version of the DT type data element is only used in the ISA segment. All other DT types are of the eight-digit variety.

Time

A time data element is used to express the ISO standard time HHMMSSd..d format in which HH is the hour for a 24 hour clock (00 to 23), MM is the minute (00 to 59), SS is the second (00 to 59) and d..d is decimal seconds. The representation for this data element type is "TM." The length of the data element deter-mines the format of the transmitted time.

EXAMPLE

Transmitted data elements of four characters denote HHMM. Transmitted data elements of six characters denote HHMMSS.

2.2.3 Composite Data Structure

The composite data structure is an intermediate unit of information in a segment. Composite data structures are composed of one or more logically related simple data elements, each, except the last, followed by a sub-element separator. The final data element is followed by the next data element separator or the segment terminator. Each simple data element within a composite is called a component. Each composite data structure has a unique four-character identifier, a name, and a purpose. The identifier serves as a label for the composite. A composite data structure can be further defined through the use of syntax notes, semantic notes, and comments. Each component within the composite is further characterized by a reference designator and a condition designator. The reference designators and the condition designators are described below. Composite data structures used in the student records transaction sets are defined in Appendix B.

2.2.4 Data Segment

The data segment is an intermediate unit of information in a transaction set. In the data stream, a data segment consists of a segment identifier, one or more composite data structures or simple data elements each preceded by a data element separator and succeeded by a segment terminator.

Each data segment has a unique two- or three-character identifier, a name, and a purpose. The identifier serves as a label for the data segment. A segment can be further defined through the use of syntax notes, semantic notes, and comments. Each simple data element or composite data structure within the segment is further characterized by a reference designator and a condition designator.

2.2.4.1 Reference Designator

Each simple data element or composite data structure in a segment is provided a structured code that indicates the segment in which it is used and the sequential position within the segment. The code is composed of the segment identifier followed by a two-digit number that defines the position of the simple data element or composite data structure in that segment.

EXAMPLE

- The third simple element of the ATV segment would be identified as ATV03.
- The sixth position in the ATV segment is occupied by a composite data structure that contains 15 component data elements. Regardless of the number of components, the reference designator for the seventh simple component data element is still ATV07.

2.2.4.2 Requirement Designator

Data element requirements within a segment are of three types: mandatory, optional, and relational. They define the circumstances under which a data element may be required to be present or not present in a particular segment.

DESIGNATOR	DESCRIPTION
M- Mandatory	The designation of mandatory is absolute in the sense that there is no dependency on other data elements. This designation may apply to either simple data elements or composite data structures. If the designation applies to a composite data structure, then at least one value of a component data element in that composite data structure shall be included in the data segment.

O- Optional — The designation of optional means that there is no requirement for a simple data element or composite data structure to be present in the segment. The presence of a value for a simple data element or the presence of value for any of the component data elements of a composite data structure is at the option of the sender.

X- Relational — Relational conditions may exist among two or more simple data elements within the same data segment based on the presence or absence of one of those data elements (presence means a data element must not be empty). Relational conditions are specified by a condition code (see table below) and the reference designators of the affected data elements. A data element may be subject to more than one relational condition. See Section 2.2.4.4, Usage Notes, for a description of the relational conditions known as Syntax Notes.

Data elements can also be designated for use in the elementary/secondary sector only or by the postsecondary sector only.

Table 2.4 Data Element Usage Designations

Must Use	The data element must be transmitted
Used	The data element is sent but not required
K12 Only	The data element is sent in elementary/secondary to elementary/secondary transmissions only
Postsec Only	The data element is sent in postsecondary transmissions only
Not Used	The data element is not sent in the current context

2.2.4.3 Absence of Data

Any simple data element that is indicated as mandatory must not be empty if the segment is used. At least one component data element of a composite data structure that is indicated as mandatory must not be empty if the segment is used. Optional simple data elements and/or composite data structures and their preceding data element separators that are not needed should be omitted if they occur at the end of a segment. If they do not occur at the end of the segment, the simple data element values and/or composite data structure values may be omitted. Their absence is indicated by the occurrence of their preceding data element separators, in order to maintain the element's or structure's position as defined in the data segment.

Likewise, when additional information is not necessary within a composite, the composite may be terminated by providing the appropriate data element separator or segment terminator.

2.2.4.4 Usage Notes

Syntax Notes

Syntax notes describe relational conditions among two or more data segment units within the same segment, or among two or more component data elements within the same composite data structure. For a complete description of the relational conditions, See 2.2.4.2 Requirement Designator.

The definitions for each of the condition codes used within syntax notes are detailed below:

Table 2.5 Condition Code Definition

P- Paired or Multiple	If any element specified in the relational condition is present, then all of the elements specified must be present.
R- Required	At least one of the elements specified in the condition must be present.
E- Exclusion	Not more than one of the elements specified in the condition may be present.
C- Conditional	If the first element specified in the condition is present, then all other elements must be present. However, any or all of the elements not specified as the first element in the condition may appear without requiring that the first element be present. The order of the elements in the condition does not have to be the same as the order of the data elements in the data segment.
L- List Conditional	If the first element specified in the condition is present, then at least one of the remaining elements must be present. However, any or all of the elements not specified as the first element in the condition may appear without requiring that the first element be present. The order of the elements in the condition does not have to be the same as the order of the data elements in the data segment.

Semantic Notes

Simple data elements or composite data structures may be referenced by a semantic note within a particular segment. A semantic note provides important additional information regarding the intended meaning of a designated data element, particularly a generic type, in the context of its use within a specific data segment. Semantic notes may also define a relational condition among data elements in a segment based on the presence of a specific value (or one of a set of values) in one of the data elements.

Comments

A segment comment provides additional information regarding the intended use of the segment.

Notes to User

These are notes that have been added to further clarify the standards within the particular context of student records transfer and the particular community (postsecondary, elementary/secondary) that is using it.

2.2.5 Segment Groups

The data segments in a transaction set may be repeated as individual data segments or as loops of multiple segments.

2.2.5.1 Repeated Occurrences of Single Data Segments

When a single data segment is allowed to be repeated, it may have a specified maximum number of occurrences defined at each specified position within a given transaction set standard. Alternatively, a segment may be allowed to repeat an unlimited number of times. The notation for an unlimited number of repetitions is ">1."

2.2.5.2 Loops of Data Segments

Loops are groups of semantically related segments. Data segment loops may be unbounded or bounded.

Unbounded Loops

To establish the iteration of a loop, the first data segment in the loop must appear once and only once in each iteration. Loops may have a specified maximum number of repetitions. Alternatively, the loop may be specified as having an unlimited number of iterations. The notation for an unlimited number of repetitions is ">1." A specified sequence of segments is in the loop. Loops themselves are optional or mandatory. The requirement designator of the beginning segment of a loop indicates whether at least one occurrence of the loop is required. Each appearance of the beginning segment defines an occurrence of the loop.

The requirement designator of any segment within the loop after the beginning segment applies to that segment for each occurrence of the loop. If there is a mandatory requirement designator for any data segment within the loop after the beginning segment, that data segment is mandatory for each occurrence of the loop. If the loop is optional, the mandatory segment only occurs if the loop occurs.

Bounded Loops

The characteristics of unbounded loops described previously also apply to bounded loops. In addition, bounded loops require a Loop Start Segment (LS) to appear before the first occurrence and a Loop End Segment (LE) to appear after the last occurrence of the loop. If the loop does not occur, the LS and LE segments are suppressed.

2.2.6 Transaction Set

The transaction set consists of a transaction set header segment, one or more data segments in a specified order, and a transaction set trailer segment. See Figure 2.1, Transmission Control Schematic. Each transaction set has a stated purpose.

Transaction Set Header and Trailer

A transaction set identifier uniquely identifies a transaction set. This identifier is the first data element of the Transaction Set Header Segment (ST). A user-assigned transaction set control number in the header must match the control number in the Trailer Segment (SE) for any given transaction set. The value for the number of included segments in the SE segment is the total number of segments in the transaction set, including the ST and SE segments. Complete details for the ST and SE segments is included with the documentation for each transaction set.

Data Segments in a Transaction Set

When data segments are combined to form a transaction set, three characteristics are applied to each data segment: a requirement designator, a position in the transaction set, and a maximum occurrence. When segments are part of a loop structure, the maximum number of times the loop can be repeated is specified. A segment may have one or more associated transaction set notes indicating intended usage or content. This guide also identifies segment usage based on sector of the educational community.

Data Segment Requirement Designators

A data segment, or loop, has one of the following requirement designators indicating its appearance in the data stream of a transmission. These requirement designators are represented by a single character code.

Table 2.6 Segment Requirement Designators

M	Mandatory - This data segment must be included in the transaction set. (Note that a data segment may be mandatory in a loop of data segments, but the loop itself is optional if the beginning segment of the loop is designated as optional.)
O	Optional - The presence of this data segment is the option of the sending party.

Data Segment Position

The ordinal positions of the segments in a transaction set are explicitly specified for that transaction. Subject to the flexibility provided by the optional requirement designators of the segments, this positioning must be maintained.

Segments in a transaction set are grouped into one of three possible sections: a required Heading Section (also referred to as Table 1), an optional Detail Section (also referred to as Table 2) and a Summary Section (also referred to as Table 3). Position numbers are 3 digits within sections. When referencing a segment's position within a transaction set, the format is X/NNN. X is '1' if the segment appears in the Table 1 Heading Section, '2' if the segment appears in the Table 2 Detail Section, or '3' if the segment appears in the Table 3 Summary Section. NNN is the position within section X as listed in the segment summary at the beginning of each transaction set.

Data Segment Occurrence

A data segment may have a maximum occurrence of one, a finite number greater than one, or an unlimited number indicated by ">1."

Transaction Set Notes

Transaction set notes provide instruction to the user identifying the intended content of a particular segment at a particular position. Position references are formatted as described above in Data Segment Position.

Data Segment Usage by Sector

Segments can be designated for use in the elementary/secondary sector only or by the postsecondary sector only.

Table 2.7 Segment Usage Designations

Must Use	The segment must be transmitted
Used	The segment is sent but not required
K12 Only	The segment is sent in elementary/secondary to elementary/secondary transmissions only
Postsec Only	The segment is sent in postsecondary transmissions only
Not Used	The segment is not sent in the current context

2.2.7 Functional Group

The functional group is delineated by the functional group header (GS segment) and the functional group trailer (GE segment). See Figure A1, Transmission Control Schematic.

Control structures within the functional group envelope include the functional identifier code in GS01. The Functional Identifier Code is used by the commercial translation software during interpretation of the interchange to determine the different transaction sets that may be included within the functional group.

Each transaction set is assigned a functional identifier code, which is the first data element of the header segment. Only those transaction sets with the same code are considered members of one functional group. For example, Transaction Set 130 has been assigned the functional group code of "ED." At this point in time TS130 is the only transaction set with this function group code and therefore would be the only type of transaction found in functional group having GS01=ED. If an inappropriate transaction set is contained within the functional group, most commercial translation software will suspend the functional group within the interchange.

The Application Sender's Code in GS02 can be used to identify the sending unit of the transmission. The Application Receiver's Code in GS03 can be used to identify the receiving unit of the transmission. The functional group contains a creation date (GS04) and creation time (GS05) for the functional group. The Group Control Number is contained in GS06. These data elements (GS04, GS05, AND GS06) can be used for debugging purposes during problem resolution. GS08,Version/Release/Industry Identifier Code is the version/release/sub-release of the transaction sets being transmitted in this functional group. The table below provides guidance for the value for this data element. The GS08 does not represent the version of the interchange (ISA/IEA) envelope but rather the version/release/sub-release of the transaction sets that are encompassed within the GS/GE envelope.

The Functional Group Control Number in GS06 must be identical to data element 02 of the GE segment. Data element GE01 indicates the number of transaction sets within the functional group. In most commercial translation software products, an aggregate count of the transaction sets is kept while interpreting the functional group. This count is then verified with data element GE01.

GS – Functional Group Header Data Element Summary					
Ref Des	**Data Elem**	**Name**	**Attributes**		
GS01	479	**Functional ID Code** This is a code identifying a group of application related transaction sets. This code set is included in Appendix B. AK Student Educational Record (Transcript) Acknowledgement Transaction Set 131 ED Student Educational Record (Transcript) Transaction Set 130 FA Functional Acknowledgment Transaction Set 997 RY Request for Student Educational Record (Transcript) Transaction Set 146 RZ Response to Request For Student Educational Record (Transcript) Transaction Set 147	M	ID	2/2
GS02	142	**Application Sender's Code** This is a code identifying the party sending the transmission. Codes are agreed to by trading partners.	M	AN	2/15
GS03	124	**Application Receiver's Code** This is a code identifying the party receiving the transmission. Codes are agreed to by trading partners.	M	AN	2/15
GS04	373	**Date** This is the date in the format CCYYMMDD. For example, a transmission made on October 20, 1991 would indicate "19911020".	M	DT	8/8

GS – Functional Group Header Data Element Summary					
Ref Des	**Data Elem**	**Name**	**Attributes**		
GS05	337	**Time** This is the time expressed in 24-hour clock time as follows: HHMM, or HHMMSS, or HHMMSSD, or HHMMSSDD, where H=hours (00-23), M=Minutes (00-59), S=Integer Seconds (00-59) and DD=Decimal Seconds; decimal seconds are expressed as follows: D=tenths (0-9) and DD=hundredths (00-99).	M	TM	4/8
GS06	28	**Group Control Number** This is an assigned number originated and maintained by the sender.	M	N0	1/9
GS07	455	**Responsible Agency Code** This is a code used in conjunction with data element 480 to identify the issuer of the standard. We will use the code "X" for the Accredited Standards Committee X12.	M	ID	1/2
GS08	480	**Version/Release/Industry Identifier Code** This is a code indicating the version, release, subrelease and industry identifier of the EDI standard being used, including the GS and GE segments. Positions 1-3 (version number), positions 4-6 (release and subrelease of version), positions 7-12 (industry or association identifier, optionally assigned by the user). Examples of the first six digits of the valid codes are: 003040 Draft Standards Approved for Publication by ASC X12 Procedures Review Board through October 1993 003052 Draft Standards Approved for Publication by ASC X12 Procedures Review Board through February 1996 004010 Draft Standards Approved for Publication by ASC X12 Procedures Review Board through October 1997 "003041ED0020" for Version 2 “003052ED0030’ for Version 3 and “004010ED0040” for Version 4 (this Implementation Guide).	M	AN	1/12

Semantic Notes:

1. GS04 is the Group Date.
2. GS05 is the Group Time.
3. The data interchange control number GS06 in this header must be identical to the same data element in the associated Functional Group Trailer GE02.

Comments:

1. A functional group of related transaction sets, within the scope of X12 standards, consists of a collection of similar transaction sets enclosed by a functional group header and a functional group trailer.

GE – Functional Group Trailer Data Element Summary					
Ref Des	**Data Elem**	**Name**	**Attributes**		
GE01	97	**Number of Transaction Sets Included** This is the total number of transaction sets included in the functional group or interchange (transmission) group terminated by the trailer containing the data element.	M	N0	1/6
GE02	28	**Group Control Number** This is an assigned number originated and maintained by the sender.	M	N0	1/9

Semantic Notes:

1. The data interchange control number GE02 in this trailer must be identical to the same data element in the associated Functional Group Header GS06.

Comment

1. The use of identical data interchange control numbers in the associated functional group header and trailer is designed to maximize functional group integrity. The control number is the same as that used in the corresponding header.

2.2.8 Interchange Control Structures

A complete transmission is delineated by the interchange header (ISA segment) and the interchange trailer (IEA segment). The interchange header starts and identifies one or more functional groups and defines the element separators and the segment terminator for the transmission, identifies the sender and receiver, and provides other control information. The interchange trailer defines the end of the transmission and provides a count of contained functional groups. Complete details for the ISA and IEA segments can be found in Section 3.1.

The interchange control number is contained in data element ISA13 of the ISA segment. The identical control number must also occur in data element 02 of the IEA segment. Most commercial translation software products will verify that these two fields are identical. In most translation software products, if these fields are different the interchange will be "suspended" in error.

There are many other features of the ISA segment that are used for control measures. For instance, the ISA segment contains data elements such as authorization information, security information, sender identification, and receiver identification. The interchange date and time data elements as well as the interchange control number within the ISA segment are used for debugging purposes when there is a problem with the transmission or the interchange. Data Element ISA12, Interchange Control Version Number, indicates the version of the ISA/IEA envelope. The ISA12 does not indicate the version of the transaction set that is being transmitted but rather the envelope that encapsulates the transaction.

The ending component of the interchange or ISA/IEA envelope is the IEA segment. Data element IEA01 indicates the number of functional groups that are included within the interchange. In most commercial translation software products, an aggregate count of functional groups is kept while interpreting the interchange. This count is then verified with data element IEA01. If there is a discrepancy, in most commercial products, the interchange is suspended. The other data element in the IEA segment is IEA02 which is referenced above.

ISA – Interchange Control Header Data Element Summary					
Ref Des	**Data Elem**	**Name**	**Attributes**		
ISA01	I01	**Authorization Information Qualifier** This is a code to identify the type of information in the Authorization Information. Examples of codes are 00 No Authorization Information Present (No Meaningful Information in ISA02)	M	ID	2/2
ISA02	I02	**Authorization Information** Information used for additional identification or authorization of the sender or the data in the interchange. The type of information is set by the Authorization Information Qualifier (1SA01).	M	AN	10/10
ISA03	I03	**Security Information Qualifier** Code to identify the type of information in the Security Information. Codes that may be used are 00 No Security Information Present (No Meaningful Information in ISA04)	M	ID	2/2
ISA04	I04	**Security Information** This is used for identifying the security information about the sender or the data in the interchange. The type of information is set by the Security Information Qualifier (1SA03).	M	AN	10/10
ISA05	I05	**Interchange ID Qualifier** Qualifier to designate the system/method of code structure used to designate the sender or receiver ID element being qualified. Codes that may be used are 21 Integrated Postsecondary Education Data System, or (IPEDS) 22 Federal Interagency Commission on Education, or (FICE) 23 National Center for Education Statistics Common Core of Data 12-Digit Number for Pre-K-Grade 12 Institutes or NCES 24 The College Board's Admission Testing Program 4-Digit Code of Postsecondary Institutions, or ATP 25 American College Testing Program 4-Digit/ Code of Postsecondary Institutions, or ACT 35 Statistics Canada Canadian College Student Information System Institution Codes 36 Statistics Canada University Student Information System Institution Codes ZZ Mutually Defined	M	ID	2/2
ISA06	I06	**Interchange Sender ID** Identification code published by the sender for other parties to use as the receiver ID to route data to them. The sender always codes this value in the sender ID element.	M	ID	15/15

ISA – Interchange Control Header Data Element Summary					
Ref Des	**Data Elem**	**Name**	**Attributes**		
ISA07	I05	**Interchange ID Qualifier** Qualifier to designate the system/method of code structure used to designate the sender or receiver ID element being qualified. Codes that may be used are 21 Integrated Postsecondary Education Data System, or (IPEDS) 22 Federal Interagency Commission on Education, or (FICE) 23 National Center for Education Statistics Common Core of Data 12-Digit Number for Pre-K-Grade 12 Institutes or NCES 24 The College Board's Admission Testing Program 4-Digit Code of Postsecondary Institutions, or ATP 25 American College Testing Program 4-Digit/ Code of Postsecondary Institutions, or ACT 35 Statistics Canada Canadian College Student Information System Institution Codes 36 Statistics Canada University Student Information System Institution Codes ZZ Mutually Defined	M	ID	2/2
ISA08	I07	**Interchange Receiver ID** Identification code published by the receiver of the data. When sending, it is used by the sender as their sending ID, thus other parties sending to them will use this as a receiving ID to route data to them.	M	AN	15/15
ISA09	I08	**Interchange Date** Date of the interchange.	M	DT	6/6
ISA10	I09	**Interchange Time** Time of the interchange.	M	TM	4/4
ISA11	I10	**Interchange Control Standards Identifier** Code to identify the agency responsible for the control standard used by the message that is enclosed by the interchange header and trailer. U This is the code to identify the United States EDI Community of ASC X12	M	ID	1/1
ISA12	I11	**Interchange Control Version Number** This version number covers the interchange control segments. Codes that may be used are 00304 Draft Standards Approved for Publication by ASC X12 Procedures Review Board through October 1993 00305 Draft Standards Approved for Publication by ASC X12 Procedures Review Board through February 1996 00401 Draft Standards Approved for Publication by ASC X12 Procedures Review Board through October 1997 "00304" for Version 2 “00305’ for Version 3 and “00401” for Version 4 (this Implementation Guide).	M	ID	5/5

ISA – Interchange Control Header Data Element Summary					
Ref Des	**Data Elem**	**Name**	**Attributes**		
ISA13	I12	**Interchange Control Number** This number uniquely identifies the interchange data to the sender. It is assigned by the sender. Together with the sender ID it uniquely identifies the interchange data to the receiver. It is suggested that the sender, receiver, and all third parties be able to maintain an audit trail of interchanges using this number.	M	N0	9/9
ISA14	I13	**Acknowledgement Requested** Code sent by the sender to request an interchange acknowledgment. Codes used are 0 No Acknowledgment Requested – do not respond with TS997 1 Interchange Acknowledgment Requested – respond with TS997 as soon as the transaction is received	M	ID	1/1
ISA15	I14	**Test Indicator** Code to indicate whether data enclosed by this interchange envelope is test or production. Codes used are T Test Data P Production Data	M	ID	1/1
ISA16	I15	**Sub-element Separator** This field provides the delimiter used to separate component data structure; this value must be different than the data element separator and the segment terminator.	M	AN	1/1

IEA – Interchange Control Trailer Data Element Summary					
Ref **Des**	**Data Elem**	**Name**	**Attributes**		
IEA01	I16	**Number of Included Functional Groups** A count of the number of functional groups included in a transmission.	M	N0	1/5
IEA02	I12	**Interchange Control Number** This number uniquely identifies the interchange data to the sender. It is assigned by the sender. Together with the sender ID it uniquely identifies the interchange data to the receiver. It is suggested that the sender, receiver, and all third parties be able to maintain an audit trail of interchanges using this number.	M	N0	9/9

3 Acknowledgment Process

3.1 Why Acknowledgements?

Student academic records are the critical "piece of paper" which qualify people for placement and admission to educational programs, jobs, and promotions. This is particularly true at the postsecondary level. As such they have long been a target for those who would like to falsify credentials. These efforts range from a student trying to fool a parent by forging a grade report to established, very profitable, diploma mills that produce total sets of false academic histories. These latter efforts have been the subject of an on-going FBI investigation. Further, developments in scanning, desktop publishing and color copying have made these efforts difficult to detect. The credentials systems we have used for centuries are threatened.

Most institutions consider academic credentials to be "official" only if they are received directly from the awarding institution. As more pursuits use educational credentials as a validation of an applicant's status or academic achievement, students need to rely on prompt delivery of those credentials when requested. Most institutions use the U.S. mail as their prime delivery medium and are unaware of whether the materials are received or not. A system which, at very low cost, verifies the delivery of student records will vastly improve the level of service institutions provide their students.

3.2 The Difference Between TS997 and TS131 After Receipt of TS130

These two transaction sets are each useful in their own way. But they have different purposes.

TS997 (Functional Acknowledgement) is a generic transaction set which is used by practically all industries sending and receiving ANSI X12 transaction sets. As such, most off-the-shelf translation software packages have built-in functionality for its use. The translator examines a received transaction and, after the examination, uses a TS997 to send back to the original sender a brief message essentially saying, "a whole X12 syntax message was received and the bits/bytes tallies seem to be what you would expect." Most systems are implemented to expect to receive such an acknowledgment and, if one is not received in a reasonable amount of time or the byte tally seems incorrect somehow, some translators may automatically resend the original transaction set in question. This is a useful function and most systems will want to implement it. As long as transmissions are working correctly, you may never hear a complaint.

TS131 (Student Educational Record (Transcript) Acknowledgement) was developed for a different purpose, is typically sent to a different place, and was designed to address the two problems described at the outset: falsification of records and positive confirmation of receipt of records.

How does TS131 work?

Implementation of TS131 requires that the institution, regardless of the electronic media in use, "register" two, or possibly three, addresses for handling transcripts. One is its receiving address for transcripts, one is its sending address (although these could be the same) and the other is its receiving address for TS131 acknowledgments. In order to address transactions properly, a participating institution needs to refresh this data in its address files regularly.

When sending a transcript, a log entry would be created which records specific items from the TS130. These include the transaction set reference number (ST02), some identification of the student (BGN02, the first REF segment and the first IN2 segment), the number of CRS segments, the number of DEG segments and the last SUM segment in the Header portion of the transmission. Most institutions create some version of a log associated with their paper processing since FERPA requires some tracking of this release of data. This electronic log would later be used for "reconciliation" of sent transcripts with acknowledgments received.

The receiver of a TS130 would capture those items from the 130 that are used to create TS131, create the transaction set, consult its institutional address tables and send the 131 to the acknowledgment address of the sender. This will probably be in addition to the more automatic TS997 functional acknowledgment.

Table 3.1 Referential Content of Acknowledgments to TS130

TS130	TS997	TS131
ISA05-06 - Sender	ISA07-08 –Receiver	
		ISA07-08 – Receiver's Acknowledgement Address
ISA07-08 – Receiver	ISA05-06 - Sender	ISA05-06 – Sender
GS01	AK101	
GS06	AK102	
ST01	AK201	
ST02	AK202	BGN02
	AK3 reports ANSI X12 syntax errors in a segment	
	AK4 reports ANSI X12 syntax errors in a data element	
	AK5 indicates acceptance or rejection of transaction set	
	AK9 summarizes the number of transaction sets received in a transmission and indicates the number of these that were accepted.	
BGN02		One of two occurrences of the REF segment with REF01 = "F8"
1st REF		One of two occurrences of the REF segment
1st IN2		IN2
Total number of CRS segments		One of two occurrences of the QTY segment with QTY01 = "E1"
Total number of DEG segments		One of two occurrences of the QTY segment with QTY01 = "E2"
Last SUM in Table 1 (position 1/310)		SUM

How does this use of TS131 help solve the problems listed above? The receiver of a TS131 will locate the corresponding sending log entry and reconcile:

- If the sending entry is found and the transactions match at all appropriate points, the acknowledgment will be flagged or checked off in some way, the date/time noted, and the transaction closed as completed. This log will track and document the level of service provided to your customers.

- If the sending entry is found, but the appropriate items do not match, a message or report depending on the local design, will try to notify the managers of the system that transmission has failed in some respect. The intended receiver either did not receive a complete, untampered document, or did not interpret it correctly. This may result in a resending of the transcript or even a contact with the trading partner to resolve some problem. This portion of the TS131 function does, partially, overlap the function of TS997. While tampering with a transmission, or only partial transmission is unlikely, this reconciliation step is designed to detect and address it.

- If the sending entry is not found, an urgent message is sent to the managers of the system. This is the RED FLAG that some entity, making use of the public availability of the data standards, has sent a falsified transcript purporting to represent work at your institution. Of course, it could also represent a failure of your logging routine for outgoing transcripts. In either case action is needed. Proper functioning in this role is the reason why a specific acknowledgment address for the institution be used, not just a turnaround, back-to-sender transaction.

The two problems with our credentials systems cited on the previous page were not created by the use of EDI. In fact, EDI offers the first real solution to development of a credentials system which will serve us well in the 21st Century. Practically all institutions have seen falsified transcripts. Most will acknowledge that the newer tools available provide would-be forgers with all he/she needs to make convincing "official" transcripts. EDI offers a way to both improve service and protect the credentials system.

Without establishing standards of good practice, EDI can provide an opportunity to make the falsified credentials problem even worse. The data standards are readily available to the public. The public has access to all the transmission media. A forger, using the standard, can create a transcript document, appearing to represent work at a reputable institution, and send it, electronically, to any participating institution. The forger is happy to see the TS997 come back indicating that the transmission was successful. The forger is not so happy that an additional TS131 was sent to a legitimate address of the purported sending institution, alerting them that their reputation for producing quality students has been attacked.

Many institutions have indicated that they accept the TS131 as a low-cost device for both improving service and to protect the integrity of their credentials. Using this as a standard of good practice, they refuse to electronically trade student records with an organization that will not properly acknowledge receipt of a TS130 using the TS131 transaction set.

3.3 Responding to a Request for a Student's Record (TS146)

TS146 (Request for Student Educational Record (Transcript)) is responded to by using TS997, TS130, or TS147. Once again these transaction sets have different purposes. TS997 would be returned using the same automatic process used when receiving a TS130. The receiver would respond with a TS130 (Student Educational Record (Transcript)) if the student can be positively identified. TS147 (Response to Request for Student Educational Record (Transcript)) is only returned if the receiver of the TS146 does not intend to respond with a TS130. The appropriate Reject Reason Code would be placed in AAA03.

Table 3.2 Referential Content of Responses to TS146

TS146	TS997	TS130	TS147
ISA05-06 - Sender	ISA07-08 –Receiver		
		ISA07-08 – Receiver's Transcript Address	ISA07-08 – Receiver's Transcript Address
ISA07-08 – Receiver	ISA05-06 - Sender	ISA05-06 – Sender	ISA05-06 – Sender
GS01	AK101		
GS06	AK102		
ST01	AK201		
ST02	AK202	BGN02	BGN02
	AK3 reports ANSI X12 syntax errors in a segment		
	AK4 reports ANSI X12 syntax errors in a data element		
	AK5 indicates acceptance or rejection of transaction set		
	AK9 summarizes the number of transaction sets received in a transmission and indicates the number of these that were accepted		
			AAA03 – Reason for not responding with a TS130
BGN02		One of ten occurrences of the REF segment with REF01 = "F8"	One of ten occurrences of the REF segment with REF01 = "F8"
IN1 loop			IN1 loop